

Application No. 10/724,314
Reply to Final Office Action of November 13, 2008

REMARKS/ARGUMENTS

Reconsideration is requested in view of the foregoing claim revisions and following remarks. Independent claims 1, 12 and 22 have been editorially revised to more precisely and accurately claim what applicant regards as the invention. Support for the above claim revision can be found in paragraphs [0016] - [0018], [0020]-[0021] and Figure 3, among other places. Claims 1-3, 5, 8, 9, 12 and 15-22 remain under consideration in the present application.

Claim Rejections – 35 USC §112

Claims 1-3, 8-9, 12 and 15-22 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite because these claims contain both slices and cross sectional images which are the same thing, and because the difference between a thick slab and a set of images is unclear.

Independent claims 1, 12 and 22 have been editorially revised to more clearly claim cross sectional images and to clearly recite performing a wavelet transform on a subgroup of cross sectional images solely in the z-axis direction to generate an axially transformed representation of at least one thick slab.

Claims 1, 12 and 22 now overcome the rejections under 35 U.S.C. §112, second paragraph. Claims 2-3 and 8-9 also now overcome the rejections under 35 U.S.C. §112, second paragraph through their dependency from claim 1. Claims 15-21 overcome the rejections under 35 U.S.C. §112, second paragraph through their dependency from claim 12. The rejection should be withdrawn.

Claim Rejections – 35 USC §103

Claims 1-2, 5, 9, 12, 15 and 22 stand rejected under 35 U.S.C. §103(a) as unpatentable over Pesquet-Popescu (US 6,898,324) in view of Pearlman et al. (US 6,674,911). Applicant respectfully traverses this rejection.

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Claim 1 is directed to a method of processing image data comprising:

receiving data indicative of a group of consecutive cross sectional images of a three dimensional volume being imaged, each of the cross sectional images being perpendicular to a z-axis, the group of consecutive cross sectional images having a first axial resolution in a z-axis direction and having a first spatial resolution in x-axis and y-axis directions orthogonal to the z-axis; and

performing a wavelet transform on a subgroup of the group of consecutive cross sectional images solely in the z-axis direction to generate an axially transformed representation of at least one thick slab having a second axial resolution lower than the first axial resolution; and

performing a wavelet transform on the at least one axially transformed representation of a thick slab in x-axis and y-axis directions to generate a spatially transformed representation of the axially transformed representation of the at least one thick slab, the spatially transformed representation having a second spatial resolution lower than the first spatial resolution.

Claim 1 requires performing a wavelet transform on a subgroup of consecutive cross sectional images in only the z-axis direction to generate an axially transformed representation of a thick slab and then performing a wavelet transform on the at least one axially transformed representation of a thick slab in x-axis and y-axis directions to generate a spatially transformed representation of the axially transformed representation of the at least one thick slab, the spatially transformed representation having a second spatial resolution lower than the first spatial resolution.

Nowhere does Pesquet-Popescu alone or in combination with Pearlman et al. teach or suggest this feature. Both Popescu and Pearlman et al. teach only three dimensional (3D) transformations of image data by simultaneously wavelet transforming each image in the x-axis, y-axis and z-axis directions to improve image viewing efficiency. Claim 1 of Popescu exemplifies the invention of Popescu that requires each frame be decomposed by means of a three-dimensional (3D) wavelet transform.

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Pearlman et al. does not remedy the deficiencies of Popescu that fails to teach or suggest performing a wavelet transform on a subgroup of consecutive cross sectional images in only the z-axis direction to generate an axially transformed representation of a thick slab and then performing a wavelet transform on the at least one axially transformed representation of a thick slab in x-axis and y-axis directions to generate a spatially transformed representation of the axially transformed representation of the at least one thick slab, the spatially transformed representation having a second spatial resolution lower than the first spatial resolution.

The theory of operation disclosed by Popescu alone or in combination with Pearlman et al. bears no resemblance to the theory of operation of the claimed invention. The claimed invention can provide averaged frames at full spatial resolution, a result not achievable using the Popescu invention alone or in combination with the invention of Pearlman et al. since the Popescu invention requires performing wavelet transformation for each level of decomposition in each direction (3D).

For at least these reasons, claim 1 is patentable over Popescu alone or in combination with Pearlman et al. Pearlman et al. does not remedy the deficiencies of Popescu that fails to teach or suggest performing a wavelet transform on a subgroup of consecutive cross sectional images in only the z-axis direction to generate an axially transformed representation of a thick slab and then performing a wavelet transform on the at least one axially transformed representation of a thick slab in x-axis and y-axis directions to generate a spatially transformed representation of the axially transformed representation of the at least one thick slab, the spatially transformed representation having a second spatial resolution lower than the first spatial resolution. Applicant does not concede the correctness of the rejection.

Claims 2, 5 and 9 are patentable over Popescu alone or in combination with Pearlman et al. through their dependency from claim 1 that is allowable. Applicant does not concede the correctness of the rejection or the relevance of the cited art as to the remaining claim features.

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Independent claims 12 and 22 are also patentable over Popescu alone or in combination with Pearlman et al. for at least the same reasons since the patentable features of claims 12 and 22 correspond to the patentable features of claim 1. Applicant does not concede the correctness of the rejection.

Claim 15 is patentable over Popescu alone or in combination with Pearlman et al. through its dependency from claim 12 that is allowable. Applicant does not concede the correctness of the rejection or the relevance of the cited art as to the remaining claim features.

Claims 3 and 8 stand rejected under 35 U.S.C. §103(a) as unpatentable over Pesquet-Popescu in view of Pearlman et al. and Dekel (US 2003/0005140). Applicant respectfully traverses this rejection for at least the same reasons discussed above regarding claim 1. Dekel does not remedy the deficiencies of Popescu alone or in combination with Pearlman et al. that fail to teach or suggest performing a wavelet transform on a subgroup of consecutive cross sectional images in only the z-axis direction to generate an axially transformed representation of a thick slab and then performing a wavelet transform on the at least one axially transformed representation of a thick slab in x-axis and y-axis directions to generate a spatially transformed representation of the axially transformed representation of the at least one thick slab, the spatially transformed representation having a second spatial resolution lower than a first spatial resolution. Applicant does not concede the correctness of the rejections or the relevance of the cited art as to the remaining claim features.

Claim 18 stands rejected under 35 U.S.C. §103(a) as unpatentable over Pesquet-Popescu in view of Pearlman et al. and Li et al. (US 6,567,081). Applicant respectfully traverses this rejection for at least the same reasons discussed above regarding claims 1 and 12. Claim 18 is patentable over the cited art through its dependency from claim 12 that is allowable. Li does not remedy the deficiencies of Popescu alone or in combination with Pearlman et al. that fail to teach or suggest performing a wavelet transform on a subgroup of consecutive cross sectional images in only the z-axis direction to generate an axially transformed representation of a thick slab and then performing a wavelet

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transform on the at least one axially transformed representation of a thick slab in x-axis and y-axis directions to generate a spatially transformed representation of the axially transformed representation of the at least one thick slab, the spatially transformed representation having a second spatial resolution lower than a first spatial resolution. Applicant does not concede the correctness of the rejections or the relevance of the cited art as to the remaining claim features.

Claims 20 and 21 stand rejected under 35 U.S.C. §103(a) as unpatentable over Pesquet-Popescu, Pearlman et al. and Li et al. in view of Dekel. Applicant respectfully traverses this rejection for at least the same reasons discussed above regarding claims 1 and 12. Dekel does not remedy the deficiencies of Popescu alone or in combination with Pearlman et al. and Li that fail to teach or suggest performing a wavelet transform on a subgroup of consecutive cross sectional images in only the z-axis direction to generate an axially transformed representation of a thick slab and then performing a wavelet transform on the at least one axially transformed representation of a thick slab in x-axis and y-axis directions to generate a spatially transformed representation of the axially transformed representation of the at least one thick slab, the spatially transformed representation having a second spatial resolution lower than a first spatial resolution. Applicant does not concede the correctness of the rejections or the relevance of the cited art as to the remaining claim features.

The invention of Li et al. only teaches use of three-dimensional (3D) wavelet transform techniques for compressing data, and then selectively decompressing a portion of the resulting compressed data to render various two-dimensional (2D) views of a 3D scene. The invention of Li et al. bears no resemblance to the claimed invention that requires first performing a wavelet transform on a subgroup of consecutive cross sectional images in only the z-axis direction to generate an axially transformed representation of a thick slab and then performing a wavelet transform on the at least one axially transformed representation of a thick slab in x-axis and y-axis directions to generate a spatially transformed representation of the axially transformed representation of the at least one thick slab, the spatially transformed representation having a second spatial resolution lower than a first spatial resolution.

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For at least these reasons, claims 20 and 21 are patentable over the cited art through their dependency from claim 12 that is allowable. Applicant does not concede the correctness of the rejection or the relevance of the cited art as to the remaining claim features.

Claims 16 and 17 stand rejected under 35 U.S.C. §103(a) as unpatentable over Popescu and Pearlman et al. in view of Examiner's official notice. Applicant respectfully traverses this rejection for at least the same reasons discussed above regarding claims 1 and 12.

Claims 16 and 17 are patentable over the cited art and Examiner's official notice through their dependency from claim 12 that is allowable. Applicant does not concede the correctness of the rejection or the relevance of the cited art and Examiner's official notice as to the remaining claim features.

Claim 19 stands rejected under 35 U.S.C. §103(a) as unpatentable over Popescu, Pearlman et al. and Li et al. in view of Examiner's official notice. Applicant respectfully traverses this rejection for at least the same reasons discussed above regarding claims 1 and 12.

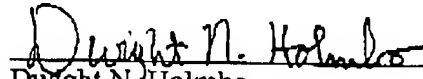
Claim 19 is patentable over the cited art and Examiner's official notice through their dependency from claim 12 that is allowable. Applicant does not concede the correctness of the rejection or the relevance of the cited art and Examiner's official notice as to the remaining claim features.

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Favorable reconsideration in the form of a Notice of Allowance is requested. If the Examiner believes a telephone conference would advance the prosecution of this application, the Examiner is invited to telephone the undersigned at (507) 351-4450.

Respectfully submitted,


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